



C/015/017 Incoming

#4080

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P.O. Box 310
15 North Main Street
Huntington, Utah 84528

April 23, 2012

Hand Delivered

Utah Coal Program
Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

RECEIVED
APR 23 2012
DIV. OF OIL, GAS & MINING

Subject: **Response to Deficiencies for the Des Bee Dove Mine#2 , Mid-Term Review, PacifiCorp, Des Bee Dove Mine, C015/0017, Task ID #4012, Emery County, Utah**

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company ("Energy West") as mine operator, hereby submits responses to the deficiencies of the Des Bee Dove Mine Mid-Term Review.

Energy West received the Deficiency List document on January 31, 2012 and responded on March 1, 2012. The Division determined that there were additional deficiencies that needed to be addressed as part of the Mid-Term Review. During a recent Mid-Term Review for the Cottonwood/Wilberg Mine (Task ID#3940/#4003), there were similar, deficiencies (specifically the deficiencies dealing with Volume 9) identified for correction. As these deficiencies have been previously been addressed in the reply to the Cottonwood/Wilberg Mine mid-term review, they have been noted in the attached Deficiency Response Document.

Energy West has updated the required information and has included eight (8) copies for review. The C1/C2 forms are included with this submittal. If you have any questions or concerns regarding this document, please contact myself at (435) 687-4712 or Dennis Oakley at (801) 220-4607.

Sincerely,

Kenneth S. Fleck

Kenneth Fleck
Geology and Environmental Affairs Manager

Enclosure: Response to Deficiencies
C1/C2 Forms
Amended Volume 8 text section
Amended Volume 2 Part 3, page 3-7

Cc: File

The following responses to deficiencies are formatted as found in the Deficiency List document. They are broken down into logical section headings similar to the R645 regulations. In each section, the regulation number along with the associated deficiency is followed by the permittee's italicized response.

R645-301-632 and 642: The Permittee must revise the text in Volume 8 by including references to the locations of subsidence reports for Cottonwood Mine, Deer Creek Mine, and Des Bee Dove mines. If no subsidence monitoring has/is currently occurring at any of the specific mines, then this should also be referenced in this section. (AA)

The noted Volume 8 was assembled in the early 80's to discuss the general geology of East Mountain. This information was separated out into one volume since the overall geology was consistent for each of the three owned mines; Wilberg, Deer Creek, and Des Bee Dove mines. Subsidence, however, was unique for each of these mines because of the different mining methods utilized. Deer Creek and Wilberg conducted longwall mining. Des Bee Dove conducted room and pillar mining. Each of the mines distinct MRP's contains the detailed information required by Utah Coal Regulations R645-301-600.

The Volume 8 text section has been revised to 1) update information and maps with the section, and 2) include references as to where subsidence monitoring information is found for each of the three mines. Refer to attached redlined copy of pages within Volume 8.

R645-301-731.220: The Permittee must submit updated Volume 9 Appendix A. Submittal of an up dated Volume 9 Appendix A for the Cottonwood Mine midterm review will fulfill this requirement. (KH)

Volume 9 has been updated as part of the Cottonwood/Wilberg Mine mid-term review. Deficiency responses were submitted in full to comply with Utah Coal Regulations. See the response document for Task ID # 4003 dated April 13, 2012 for the Cottonwood/Wilberg Mine mid-term review.

R645-301-728: On page 129 of the Mining Method section the Permittee states "Des-Bee-Dove area permit has been and will be mined utilizing continuous miners exclusively" this language shall be updated to indicate mining has been completed. (KH)

The Mining and Reclamation Plan of the historic Des Bee Dove Mine has been in place for many years. All mining activities have been completed and the entire mine site has undergone final reclamation. The final area to be reclaimed, the sediment pond area, was completed in 2006. The mine site is in its 9th year of reclamation responsibility. The approved MRP does not reflect the actual present conditions of the reclaimed mine and its former operations. The above state page has been revised to indicate mining has been completed. Refer to attached redlined copy.

APPLICATION FOR COAL PERMIT PROCESSING

Permit Change ☒ New Permit ☐ Renewal ☐ Exploration ☐ Bond Release ☐ Transfer ☐

Permittee: PacifiCorp

Mine: Des Bee Dove Mine

Permit Number: C/015/0017

Title: Response to Deficiencies for the Des Bee Dove Mine#2, Mid-Term Review, PacifiCorp, Des Bee Dove Mine, C015/0017, Task ID #4012, Emery County, Utah

Description, Include reason for application and timing required to implement:

Instructions: If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

- ☐ Yes ☒ No 1. Change in the size of the Permit Area? Acres: _____ ☐ increase ☐ decrease.
- ☐ Yes ☒ No 2. Is the application submitted as a result of a Division Order? DO# _____
- ☐ Yes ☒ No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
- ☐ Yes ☒ No 4. Does the application include operations in hydrologic basins other than as currently approved?
- ☐ Yes ☒ No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
- ☐ Yes ☒ No 6. Does the application require or include public notice publication?
- ☐ Yes ☒ No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
- ☐ Yes ☒ No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
- ☐ Yes ☒ No 9. Is the application submitted as a result of a Violation? NOV # _____
- ☐ Yes ☒ No 10. Is the application submitted as a result of other laws or regulations or policies?
- Explain: _____
- ☐ Yes ☒ No 11. Does the application affect the surface landowner or change the post mining land use?
- ☐ Yes ☒ No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
- ☐ Yes ☒ No 13. Does the application require or include collection and reporting of any baseline information?
- ☐ Yes ☒ No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
- ☐ Yes ☒ No 15. Does the application require or include soil removal, storage or placement?
- ☐ Yes ☒ No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
- ☐ Yes ☒ No 17. Does the application require or include construction, modification, or removal of surface facilities?
- ☐ Yes ☒ No 18. Does the application require or include water monitoring, sediment or drainage control measures?
- ☐ Yes ☒ No 19. Does the application require or include certified designs, maps or calculation?
- ☐ Yes ☒ No 20. Does the application require or include subsidence control or monitoring?
- ☒ Yes ☐ No 21. Have reclamation costs for bonding been provided?
- ☐ Yes ☒ No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
- ☐ Yes ☒ No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you. (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Kenneth Fleck
Print Name

Kenneth S. Fleck
Sign Name, Position, Date

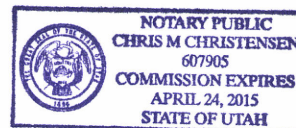
Manager of Environmental Affairs APRIL 19, 2012

Subscribed and sworn to before me this 19th day of April, 2012

Chris M. Christensen
Notary Public

My commission Expires:

Attest: State of Utah April 24, 2015 } ss:
County of Emery



For Office Use Only:

Assigned Tracking
Number:

Received by Oil, Gas & Mining

APPLICATION FOR COAL PERMIT PROCESSING

Detailed Schedule Of Changes to the Mining And Reclamation Plan

Permittee: PacifiCorp

Mine: Des Bee Dove Mine

Permit Number: C/019/0017

Title: Response to Deficiencies for the Des Bee Dove Mine#2 , Mid-Term Review, PacifiCorp, Des Bee Dove Mine, C015/0017, Task ID #4012, Emery County, Utah

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED

[illegible]

Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.

Received by Oil, Gas & Mining

PacifiCorp, Energy West Mining Company

C/015/0017

Response to Deficiencies for
the Des Bee Dove Mine, #2,
Mid-Term Review, Task ID
#4012

Volume 8, Geology Volume:

Replace Entire Text Section (redline/Strikeout copy)

GEOLOGY OF EAST MOUNTAIN PERMIT MINE PLAN AREAS (R645-301-600)

The East Mountain property is located in the central portion of the Wasatch Plateau Coal Field in Emery County, Utah (Figure G-1). Generally, this area is a flat-topped mesa surrounded by heavily vegetated slopes which extend to precipitous cliffs leading to the valley below. The plateau has a vertical relief of up to 2,500 feet, rising from Castle Valley below. The following discussion summarizes the structural geology, stratigraphy, and economic coal deposits of the region and the permit mine plan areas located within the East Mountain property.

DATA COLLECTION

Applicant has been collecting data regarding the East Mountain property and adjacent area since 1971. As a result, over 110 exploration drill holes wherein data were collected regarding the coal seams and enclosing strata (see Map EC-10424-EM) have been completed from the surface. Nine of the holes were core drilled through the coal zone and all were geophysically logged. Usually, the surface holes are located on about ¼ to ½ mile centers. In addition to these holes, over 200 holes which provide valuable data on as close as 500 foot centers have been drilled from within the mines.

The coal seams exposed on outcrop and within the mine workings have been mapped in detail providing data which is valuable in understanding the coal geology.

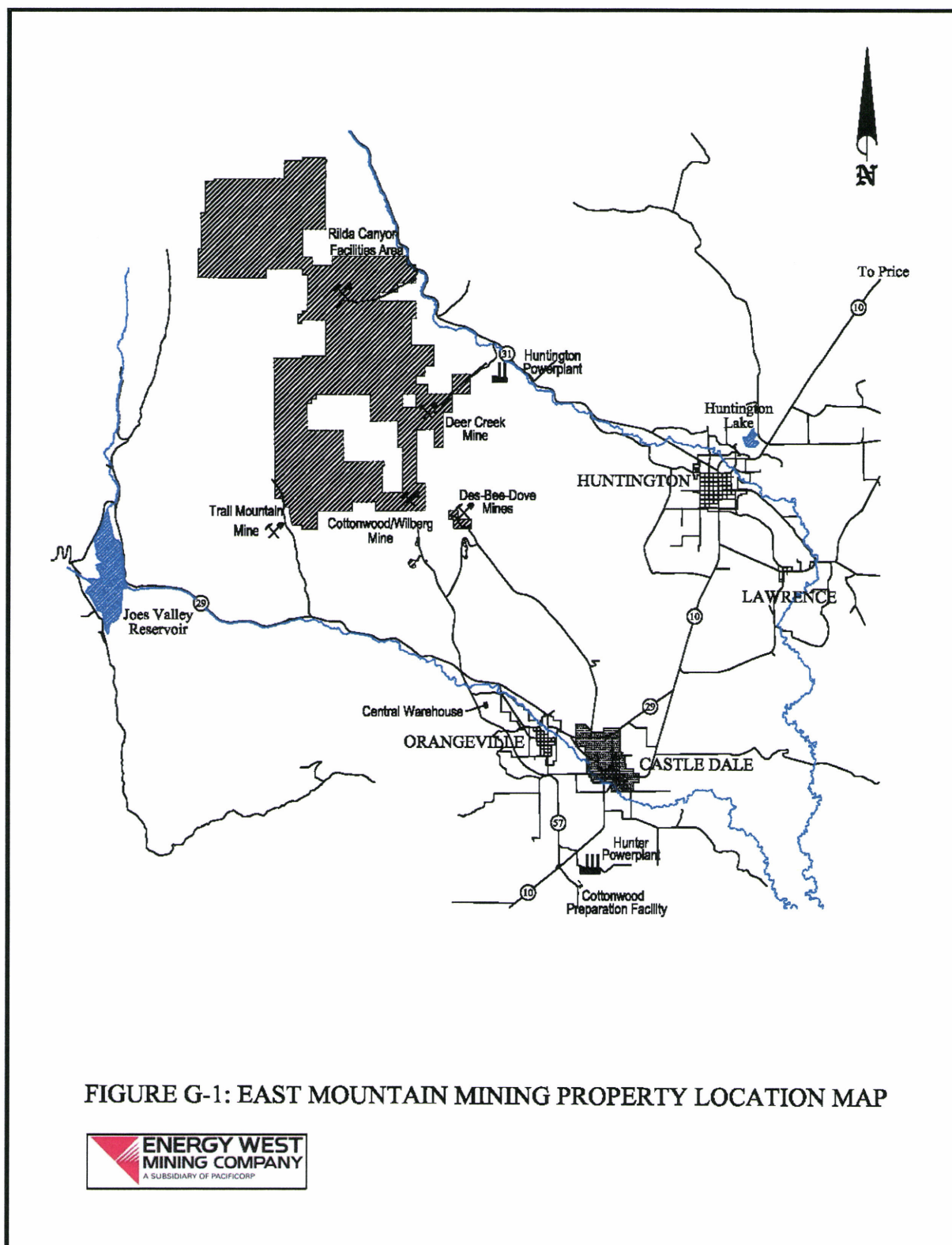
The interpretations made herein are based on data collected from all of the above sources in addition to the published regional data. All of these data allow the construction of a geologic model which represents the conditions present in the permit mine plan and adjacent areas and the property in general.

The applicant has made a practice of submitting to the BLM, each year, copies of both lithologic and geophysical logs of all drill holes, surface and underground, drilled within federal leases or on fee land. This practice will continue throughout the lifetime of the mining permit.

STRUCTURE

The geologic structure of the area is fairly simple. The strata are gently down-folded in the area of the Straight Canyon Syncline which is present in the northern portion of the property (see maps CE-10693-EM and CE-10694-EM). Dips in the syncline range from two to six degrees with the north limb dipping the steepest.

In the area south of the Straight canyon Syncline the coal seams dips gently in the northwest direction toward the syncline; however, to the northwest of the Straight



Canyon Syncline both the Hiawatha and Blind Canyon seams dip in a southeast direction at three to five degrees. The dip and strike of the coal seams can be better visualized on maps CE-10693-EM and CE-10694-EM which are included herein.

FAULTING

The strata within the property have been offset by a series of north-south trending fault zones. Generally, the faults are nearly vertical and do not have significant amounts of fault gouge or drag associated with them. One of the major faults present in the region, Pleasant Valley Fault, has been intersected in both the Deer Creek and Wilberg mines (refer to Map CE-10694-EM).

The Pleasant Valley Fault consists of two parallel fractures about 150 feet apart (see Map CE-10694-EM and Cross-Section CE-10244-EM). The fault's total displacement, where it was intersected in the Deer Creek Mine, to the north is 150 feet with its downthrown side on the east. The displacement diminishes to less than one foot where it was intersected in the Wilberg Mine near the south end of the property.

Another north-south trending fault, the Deer Creek Fault, is present to the east of the Pleasant Valley Fault. It limits the eastward development of the Wilberg/Cottonwood and Deer Creek mines. The displacement of the Deer Creek Fault ranges 100 to 170 feet with the east block being downthrown.

A northeast-southwest trending fault system, the Roans Canyon Graben, is present along the axis of the Straight Canyon Syncline. The system contains up to six normal faults having displacements ranging from a few feet to over 150 feet. Coal deposits present to the north of the fault will be were accessed through rock tunnels being driven from the 3rd North section of the Deer Creek Mine. The Roans Canyon Graben forms a major aquiclude to the southward migration of groundwater and is discussed in greater detail in the hydrologic section of the permit Volume 9, Hydrology of East Mountain.

JOINTING

The jointing in the coal's overburden plays an important factor in how the rock will react when it is undermined. Because of this, the joint systems in the Castlegate Sandstone outcrops exposed in the southern end of East Mountain and in Rilda Canyon were mapped. In the southern end of East Mountain the dominant joint trend is N52°W with a secondary trend in a N80°E direction. In the Rilda Canyon area the strongest joint trend is north-south with a very weak trend in a N80°W direction (see maps CE-10870-EM and CE-10790-EM). This data should play an important role in understanding how the Castlegate cliffs will react when undermined and will be incorporated into a predictive model designed to forecast how the cliffs will respond to mining.

STRATIGRAPHY

The rock formations exposed in the East Mountain area range from Upper Cretaceous to Tertiary in age (see Figure G-2). The formations, in ascending order, are the Masuk Shale member of the Mancos Shale, Starpoint Sandstone, Blackhawk, Castlegate Sandstone, Price River, North Horn, and Flagstaff formations. The coal deposits are restricted to the lower portion of the Blackhawk Formation.

The Masuk Shale is the upper member of the Mancos Shale and consists of light to medium gray marine mudstones. Usually this formation weathers readily, forming slopes which are often covered by debris. It is generally devoid of water.

Overlying and inter-tonguing with the Masuk Shale is the Starpoint Sandstone. In the East Mountain area the Starpoint consists of three or more cliff-forming massive sandstones totaling about 400 feet in thickness. Generally, the sandstones are fine to medium-grained and moderately well-sorted. The upper contact of the Starpoint is usually quite abrupt and readily identifiable on the outcrop. Locally, the Starpoint Sandstone exhibits aquifer characteristics. This formation is the first aquifer found below the coal seam to be mined. Its hydrologic characteristics are discussed in detail in the hydrologic section of the permit Volume 9, Hydrology of East Mountain.

The Blackhawk Formation consists of alternating mudstones, siltstones, sandstones, and coal. Although coal is generally found throughout the Blackhawk Formation, the economic seams are restricted to the lower 150 feet of the formation. The sandstones contained within the Blackhawk Formation are fluvial and increase in number in the upper portions of the formation. Many of the tabular sandstone channels form local perched water tables. The total thickness of the Blackhawk Formation in the East Mountain area is about 750 feet.

The Castlegate Sandstone generally caps the escarpment which surrounds the eastern limit of the property mine plan area. The Castlegate consists of about 250 feet of coarse-grained, light gray, fluvial sandstones; pebble conglomerates; and subordinate zones of mudstones. Although the sandstone is very permeable, it lacks water because of insufficient recharge.

The Price River Formation overlies the Castlegate Sandstone. The formation is about 350 feet thick and forms slopes which extend upward from the Castlegate escarpment. Although some mudstones are present, fine-grained, poorly sorted sandstones dominate the Price River Formation. The Price River Formation generally lacks water.

Figure G-2

**Stratigraphy of East Mountain
(Doelling, 1972)**

System	Series	Stratigraphic Unit		Thickness (feet)	Description
TERTIARY	Eocene	Green River Formation		-	Chiefly greenish lacustrine shale and siltstone.
	Paleocene	Wasatch Group	Colton Formation	300 -1,500	Varicolored Shale with Sandstone and limestone lenses, thickness to the north.
			Flagstaff Limestone	200 - 1,500	Dark yellow-gray to cream limestone, evenly bedded with minor amounts of sandstone, shale, and volcanic ash, ledge former.
			North Horn Formation (Lower Wasatch)	500 - 2,500	Varigated shales with subordinate sandstone, conglomerate and freshwater limestone, thickens to north, slope former.
Maestrichthian	Mesaverde Group		Price River Formation	600 - 1,000	Gray to white gritty sanstone interbedded with subordinate shale and conglomerate, ledge and slope former.
Campanian		Castlegate Sandstone	150 - 500	White to gray, coarse-grained often conglomeratic sanstone, cliff former, weathers to shades of brown.	
		Blackhawk Formation MAJOR COAL SEAMS	700 - 1,000	Yellow to gray, fine- to medium-grained sandstone, interbedded with subordinate gray and carbonaceous shale, several thick coal seams.	
		Star Point Sandstone	90 - 1,000	Yellow-gray masive cliff-forming sandstone, often in several tongues separated by Masuk Shale, thickens westward.	
CRETACEOUS	Santonian	Mancos Shale	Masuk Shale	300 - 1,300	Yellow to blue-gray sandy shale, slope former, thick in north and central platear area, thins southward.
			Emery Sandstone COAL (?)	50 - 800	Yellow-gray friable sandstone tongue or tongues, cliff former, may contain coal (?) in south part of platear if mapping is correct, thickens to west and south. Coal may be present in subsurface to west.
	Coniacian		Blue Gate Member	1,500 - 2,400	Pale blue-gray, nodular and irregularly bedded marine mudstone and siltstone with several arenaceous beds, weathers into low rolling hill and badlands, thickens northerly.
	Turonian		Ferron Sandstone Member MAJOR COAL SEAMS	50 - 950	Alternating yellow-gray sandstone, sandy shale and gray shale with important coal beds of Emery coal field, resistant cliff former, thickens to south.
			Tununk Shale Member	400 - 650	Blue-gray to black sandy marine slope forming mudstone.
	Cenomanian		Dakota Sandstone MINOR COAL	0 - 60	Variable assemblages of yellow-gray sandstone, conglomerate shale and coal. Beds lenticular and discontinuous.
	Albian				

Generalized section of rock formations, Wasatch Plateau coal field.

The North Horn Formation is about 850 to 900 feet thick in the East Mountain area. Mudstones dominate the rock types present and are generally gray to light brown in color. Localized, lenticular sandstone channels are present throughout the formation. The sandstone beds are more common near the upper and lower contacts of the formation and many times host localized perched water tables.

The Flagstaff Formation is the youngest formation exposed in the permit mine plan area and consists of white to light gray lacustrine limestone. An erosional remnant of 100 to 150 feet of this formation remains, forming a cap on the highest plateaus. The formation is fairly well fractured, allowing surface water to percolate down to lower strata.

ECONOMIC COAL OCCURRENCES

Three economic coal seams are present on within the property mine plan area: the Hiawatha, the Cottonwood, and the Blind Canyon seams. The current workings of the Cottonwood/Wilberg Mine are located in the basal, or Hiawatha, seam.

The Hiawatha Seam is of mineable thickness in both the southern and extreme northern portions of the East Mountain property (see Map CE-10695-EM). The seam rests directly on the Starpoint Sandstone and ranges in thickness from sixteen (16) feet to less than five (5) feet. The Hiawatha Seam is not present throughout a major portion of the property. This lack of coal is due to a major distributary river channel which flowed through the coal swamp in an easterly direction.

The Blind Canyon Seam, the second major mineable seam within the East Mountain property mine plan area, is located from fourteen (14) to 140 feet above the Hiawatha Seam (see Map CE-10691-EM). The average separation between the seams is seventy to eighty (70-80) feet but increases up to 140 feet in the southern portion of the property. The Blind Canyon Seam is of mineable thickness through most of the property and is mined through the Deer Creek Mine. The seam ranges in thickness from sixteen (16) feet to less than five (5) feet (see Map CE-10696-EM). The seam thins to less than five (5) feet in the southwest portion of the property.

The Cottonwood Seam is located stratigraphically between the Hiawatha and Blind Canyon seams. The seam is located generally about seventy (70) to ninety (90) feet above the Hiawatha Seam (see Map CE-10692-EM) but is found in mineable thickness only in the south half of lease U-47978 where it reaches up to sixteen (16) feet in thickness. The seam is extensively burned on outcrop. Heat released from the burn has elevated the temperature of the strata to above 250° Fahrenheit in some areas.

Because of its high temperature, the Cottonwood Seam reserves are not mineable using current technology. Data indicate that the burn is currently inactive despite the high temperatures.

OVERBURDEN

The coal reserves in the East Mountain property **mine plan area** within the Hiawatha Seam are covered by up to 2,300 feet of overburden. Because the topography of the lands displays much relief, the thickness of the overburden is highly variable (see Map CE-10703-EM) and cross-section CE-10244-EM). The overburden is the greatest in the western and northern portions of the property where the plateau is capped with the Flagstaff Limestone. In these areas the overburden ranges from 2,200 - 2,300 feet; however, the overburden above most of the coal is less than 1,800 feet.

The overburden above the Blind Canyon Seam is depicted on Map CE-10704-EM. Its thickness ranges from less than 100 feet to 2,200 feet. The average overburden is 1,700 feet.

CHEMICAL COMPOSITION

In the development of the Applicant's mines and associated surface facilities, some of the strata and alluvium covering the coal seam was excavated to accommodate the facilities. In order to better understand the chemical and physical characteristics of the rock material that was excavated, over 130 samples from both outcrop and core from drill holes were analyzed.

Four drill holes were selected as data points in which core samples analyzed for their chemical and physical properties (see Figure G-3). The core drill holes were selected to give the best representation of the same rock sequence which was excavated at the Wilberg Mine portals. Two of the holes were drilled from the surface of East Mountain (EM-12C and EM-23C), and two of the holes were drilled from within the Deer Creek and Wilberg mines (A-25 and B-124).

Samples of rock core were collected from each lithologic unit that was penetrated within the selected drill holes. The samples consisted of a representative section of core averaging 0.3 feet in length, usually taken from the center of each lithologic unit. Samples of rocks which were immediately overlain by mineable coal seams were collected at the coal seam contact. The rock zones sampled and the sample numbers are shown on the core logs for each drill hole (see core logs in Appendix).

In light of the recommendation made by the office of Surface Mining (OSM), each sample was analyzed for the following:

pH	Alkalinity (equivalent CaCO_3)
EC (electrical conductivity)	% Iron
% Calcium	% Zinc
% Magnesium	% Sulfate
% Sodium	% Molybdenum
SAR (Sodium Absorption Ratio)	% Boron

All of the samples of carbonaceous mudstone that were collected were also analyzed for percent pyrite/marcasite content. The samples collected from immediately below a mineable coal seam were analyzed for clay content. In addition to these analyses, four or five representative samples of each of the rock types present --sandstone, siltstone, mudstone, interbeds (thinly laminated siltstone and mudstone), carbonaceous mudstone, and coal -- were crushed to a size of minus $\frac{1}{4}$ " mesh and the product screened for percent sand, silt, and clay content.

Front Range Labs, Inc. of Fort Collins, Colorado was selected to do the analytical work because of its expertise in testing chemical and physical properties of coal overburden and its ability to perform all of the required analytical work.

Applicant has previously established an excellent database regarding the coal quality within the East Mountain property mine plan area. Samples have been collected from within the Deer Creek and Wilberg mines. These samples were analyzed by Standard Laboratories, Inc. in Huntington, Utah. Some of the data reported herein have been gleaned from this work.

The findings of the analyses are separated by formation, rock type, and coal seam in Table G-1. The mean and standard deviations have been calculated for each of the various chemical and physical parameters for each rock type.

In general, the chemical content within a rock type is moderately consistent, as shown by the standard deviations. However, the sulfate content of the sandstones and siltstones is variable due to sulfate enrichment by groundwater in some of these rock types and not others.

The sulfur content in the Hiawatha, Cottonwood, and Blind Canyon seams averages 0.52% and generally ranges from 0.49% to 0.59%. Of this sulfur content, 79% is in the form of organic sulfur and 16% is in the form of pyritic including marcasite; the remainder is in the form of sulfate.

TABLE G-1 ANALYTICAL SUMMARY OVERBURDEN ANALYSES																
Lithology	Number of Samples		Chemical Tests										Physical Tests			
	Chemical Tests	Physical Tests	Ca Meq/L	Mg Meq/L	Na Meq/L	1 ₅ AR	Fe ppm	Zn ppm	SO ₄ -S ppm	Mo ppm	B ppm	pH (paste)	E.C. mmhos/cm	Sat. %	Pyrite FeS ₂	Crushed Rock Texture
Blackhawk Formation																
Sandstone:	26	2														
Mean			4.37	8.18	2.13	1.05	8874.00	11.47	409.60	0.10	0.06	8.00	1.55	21.70	—	Sandy Loam
S.D.			3.91	5.13	1.08	0.69	6672.00	9.70	353.10	0.00	0.06	0.96	0.89	3.36	—	
Siltstone:	24	5														
Mean			3.06	6.24	2.20	1.60	14512.88	38.26	464.41	0.10	0.18	7.88	1.41	20.81	2.3	Sandy Loam
S.D.			2.63	7.23	2.78	3.72	8782.40	21.29	1222.63	0.00	0.16	1.08	1.72	1.82	0	
Mudstone:	24	4														
Mean			3.12	3.13	4.79	4.28	11074.13	70.31	233.96	0.10	0.28	8.00	1.10	23.99	—	Sandy Loam
S.D.			2.36	2.89	12.76	12.58	5350.17	79.99	275.10	0.00	0.23	0.31	1.12	4.88	—	
Interbeds:	15	3														
Mean			4.34	7.98	2.79	1.30	10982.13	21.58	346.95	0.10	0.12	8.05	1.58	20.56	—	Loamy Sand
S.D.			3.13	6.37	1.05	1.36	6584.59	9.97	359.46	0.00	0.11	0.23	0.92	1.33	—	
Carbonaceous Mudstone	25	3														
Mean			6.19	6.51	3.70	2.40	9933.76	58.04	438.86	0.10	0.42	7.53	1.54	34.76	2.3	Loamy Sand
S.D.			4.85	8.42	4.85	3.98	6112.12	38.94	378.81	0.00	0.34	0.85	1.14	9.94	3.29	
Coal (Blind Canyon)	8	0														
Mean			1.55	1.81	1.68	1.63	2089.38	10.19	103.88	0.10	0.06	8.00	0.36	60.66	0.44	
S.D.			0.59	2.88	1.35	1.27	2557.56	8.82	66.88	0.00	0.05	0.25	0.05	18.59	0.06	
Coal (Hiawatha)	2	0														
Mean			1.52	2.85	1.41	1.58	2532.41	10.82	97.32	0.10	0.12	7.95	0.34	60.24	0.51	
S.D.			0.66	3.64	0.95	1.18	2718.02	8.41	72.14	0.00	0.21	0.24	0.07	16.84	0.06	
Coal (Cottonwood)	1	0														
Mean			2.50	3.30	0.47	2.21	465.00	55.00	321.00	0.96	0.43	7.40	1.40	21.86	0.49	
S.D.															0.07	
Starpoint Sandstone																
Sandstone:	11	4														
Mean			5.14	8.58	3.42	3.57	3798.00	9.47	1457.00	0.10	0.11	6.76	2.49	30.46	—	Sandy Loam
S.D.			3.89	4.69	2.97	5.18	2965.00	6.98	2578.00	0.00	0.24	1.54	1.20	4.80	—	

The physical test which were completed on the samples indicate that all rock types present have the tendency to resist reduction of grain size when excavated and reclaimed, and only a minimum of clay-sized particles will be liberated. As may be expected, the coarser-grained rocks, sandstones, and siltstones produced much less clay-sized particles when crushed.

In addition to the aforementioned analyses of the general overburden, the strata immediately above and below the coal seam were analyzed for potential alkalinity and pyrite/marcasite content. The strata immediately below the coal were analyzed for clay content as well. The results of the test are as follows:

Zone Sampled	Number of Samples	pH	% FeS ₂ Pyrite/Marcasite)	% Clay	Potential Alkalinity (equivalent CaCO ₃ , Mg/L)
Hiawatha Seam Roof	3	7.8	3.3	----	218,400
Hiawatha Seam Floor	3	7.5	1.3	5.5	127,300
Cottonwood Seam Roof	2	7.8	0.5	5.2	222,200
Cottonwood Seam Floor	1	8.7	0.4	10.5	70,200
Blind Canyon Seam Roof	2	8.1	0.5	----	252,600
Blind Canyon Seam Floor	3	8.3	1.3	9.0	3,500

The analyses of the overburden samples tested clearly show that no toxic or hazardous materials are present. The material excavated near the portal site is slightly alkaline. Generally, the soils in the region which are derived from the strata tested are alkaline as well. The overburden material which has been excavated will not degrade the quality of the soils in the area of the ground water percolating through this material.

LOCATION OF GAS OR OIL WELLS

There are no oil or gas wells within the permit area. There is one gas well located within the East Mountain mine plan area. It is located in Section 23, T. 16 S., R. 6 E. and within lease UTU88554. The well (Mountain Unit 32-23) is owned and operated by Merit Energy Co. and is a producing well. Total depth of this hole is 7,476', and the hole is completed in the Ferron Sandstone. Several gas wells have been developed in Cottonwood Canyon to the west and Huntington Canyon to the Northwest of the permit mine plan area. The proposed mining activities will have no affect on the existing wells nor will the wells in any way affect the mining.

PacifiCorp, Energy West Mining Company

C/015/0017

Response to Deficiencies for
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constructing seals. These seals will be constructed in accordance with MSHA regulations.

Upon final extraction of the mine, portal seals will be constructed. Prior to any construction, however, BLM officials will be notified and approval obtained.

MINING METHOD

Due to geologic constraints, Des Bee Dove Mine is limited strictly to room-and-pillar methods employing continuous mining units. (Portals permanently sealed in 1987. Final Reclamation of mine site completed June 2003. Mining operations no longer exist)

Figure 2 illustrates the basic configuration of the main entries. A six-entry system is planned for the main headings with openings driven 20 feet wide on 80 foot centers. The pillars created thereby measure 60 feet by 80 feet, a size which, has proven sufficient to control mining induced overburden stress.

For development of room-and-pillar sections at Des Bee Dove Mine, three to five entries will be opened on advance with two or more developed on retreat in conjunction with pillar extraction. Openings are 20 feet wide on 50 foot x 100 foot centers. The sequence of pillar recovery is shown in Figure 3 (near the end of advance and beginning of retreat and pillaring). Figure 4 shows in detail the method planned for recovering individual pillars. (Refer to Appendix II, Part 3, Fig. 2 to 6)

Figure 6 indicates that at 60% pillar recovery, leaving a foot of top coal, results in just over 50% coal recovery for the mining configuration planned at Des Bee Dove.

MINE PRODUCTION